



# **Need Assessment for the Star Shoot Parkway Extension**

Prepared for:

**Lexington-Fayette Urban  
County Government**

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## **Introduction**

WSA was asked to review the relative need and timing for the connection of the existing section of Star Shoot Parkway to Liberty Road. This connection would serve two principal purposes: provide relief for motorists around Hamburg Place and the surrounding area of Lexington, and provide improved access to a proposed new school on Liberty Road adjacent to the proposed extension.

## **Project Context**

Hamburg Place development in eastern Fayette County is a large multi-use development bordered by Man O' War Boulevard, Winchester Road, and I-75 and bisected by Sir Barton Way. Currently, development is predominately concentrated toward Man O' War Boulevard and consists of retail, office, and residential land uses. Development is expected to continue along Sir Barton Way toward Winchester Road.

The latest two approved major developments are a retail development in the southeast quadrant of the Winchester Road/Sir Barton Way intersection and the Tuscany residential neighborhood. According to a traffic study conducted by Quest Engineers (February 2005), the retail development at the corner of Winchester Road and I-75 is expected to provide 550,000 additional square feet of retail space. The Tuscany residential neighborhood on the west side of Sir Barton Way is expected to include 1500 single family homes and 1800 apartments. Other smaller developments are also proposed within the Hamburg development.

According to the 2001 Comprehensive Plan Update, the eastern portion of Fayette County is one of the largest growth areas within the county. New residential development north of Winchester Road and south of Man O' War Boulevard has sprung up and is expected to continue over the next several years.

## *Study Limits*

This study considers primarily the area bordered by Man O' War Boulevard, Todds Road, Liberty Road, New Circle Road, Winchester Road, and I-75. Key intersections include Sir Barton Way at Man O' War Boulevard, Todds Road at Man O' War Boulevard, and Sir Barton Way at Winchester Road. A study area map is shown on the following page.



*Liberty Road*

Currently, Liberty Road is a narrow 2-lane road between Man O' War/Todds Road and New Circle Road. The existing Liberty Road/Todds Road intersection is an offset intersection with stop signs controlling each intersection. Queues regularly occur along southbound Liberty Road during the PM peak period. Additionally, the poor level of service at the Man O' War and Todds Road intersection can cause queues to back up all the way to the Liberty Road/Todds Road intersection.

*Star Shoot Parkway*

Star Shoot Parkway is a four-lane street with a grass median that runs between Hamburg Pavilion and the Shetlands neighborhood. Star Shoot Parkway terminates at the Shetlands neighborhood and currently doesn't provide access to Liberty Road. The intersection at Sir Barton Way is signalized, while all others along Star Shoot Parkway remain unsignalized. Star Shoot Parkway, southwest of Pink Pigeon Parkway, carries local traffic to and from the Shetlands and West Wind neighborhoods.

*Background Traffic*

Daily and peak hour traffic counts were obtained from the Kentucky Transportation Cabinet (KYTC), Lexington Fayette Urban County Government (LFUCG), and the Revised Traffic Impact Study for Hamburg Place conducted by Quest Engineers (February 2005). Daily counts are shown in the following table, while peak hour counts are discussed in more detail in the following section.

**2005 Average Daily Traffic Volumes (ADT)**

Roadway	Limits	ADT*
Man O' War Blvd.	Todds Road and Palumbo Drive	35,000
Winchester Road	New Circle Road and I-75	37,000
New Circle Road	Winchester Road and Liberty Road	43,000
Liberty Road	Todds Road and New Circle Road	11,000
Sir Barton Way	Star Shoot Parkway and Winchester Road	12,000

\* 2005 Estimate

### *Level of Service Analysis*

The *Highway Capacity Manual*<sup>1</sup> uses the concept of Level of Service (LOS) to describe traffic flow during a given time period. Weekday morning and evening and weekend peak hour periods are typically analyzed using a letter grading system that ranges from A to F. LOS A represents free flow conditions where drivers travel at desired speeds without delay, while LOS F indicates failed conditions where delay is very high and speeds are very low. For planning and analysis purposes, LOS D conditions are typically assumed to be acceptable for urban areas.

Level of service along the portion of Man O' War within the study limits is at or near unacceptable levels during the P.M. peak hour, generally considered LOS E and LOS F, for several intersections based on analysis provided by LFUCG Division of Traffic Engineering. The intersections of Todds Road, Pink Pigeon Parkway, and Sir Barton Way with Man O' War are currently LOS E, LOS D, and LOS D, respectively. The nearby intersection of Sir Barton Way and Alysheba Way is also LOS E.

The most recent traffic analysis within the project area was completed by Quest Engineers for the Winchester Road Retail portion of Hamburg Place. As part of this analysis, they analyzed a development scenario for Year 2010 that included the Winchester Road retail tracts, Tuscany residential tracts, and other known trip generators currently under development. The additional land uses are shown in Appendix A. The original study and follow-up analysis completed in February 2005 showed a LOS D at the intersection of Sir Barton Way and Winchester Road. All other intersections within the analyzed study area were LOS D or better.

Additional follow-up analysis completed by Quest Engineers expanded their study area to include three additional intersections including: Sir Barton Way/Man O' War Boulevard, Todds Road/Man O' War Boulevard, and the proposed intersection of Star Shoot Parkway/Liberty Road. LOS at these intersections was not provided with this follow-up analysis.

Using the 2010 forecasted traffic volumes reviewed and approved by the LFUCG Planning Division, LOS was analyzed for the P.M. peak hour at the following intersections: Sir Barton Way at Man O' War Boulevard and Todds Road at Man O' War Boulevard. Both of these intersections would

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<sup>1</sup> Transportation Research Board, National Research Council. *Highway Capacity Manual*. Washington DC: 2000.

result in LOS F in Year 2010, assuming the above defined Year 2010 development scenario and no improvements to the intersections. No forecast was derived for Pink Pigeon Parkway and Man O' War Boulevard; however, it is reasonable to conclude this intersection would experience unacceptable LOS as well. This conclusion is based on the amount of traffic growth at the upstream and downstream intersections and the understanding that Pink Pigeon Parkway would experience similar growth. LOS at the intersection of Sir Barton Way and Winchester Road would remain LOS D, as calculated in the original traffic study.

It is important to note that the trip generation, distribution, and assignment provided by Quest Engineers assumes the Star Shoot Parkway extension would be completed in 2010. Without the Star Shoot Parkway connection, approximately 700 total P.M. peak hour trips would be diverted to other entrances including Sir Barton Way and Pink Pigeon Parkway. Without this extension, the Sir Barton Way intersection with Winchester Road would not maintain acceptable LOS D or better.

### **Future Improvements**

#### *Liberty Road/Todds Road*

According to the Lexington Area MPO's *2030 Transportation Plan for Fayette and Jessamine Counties* (June 2004), the Cadentown Bypass is scheduled to be widened in Fiscal Year (FY) 2007. This project will improve Liberty Road and Todds Road north and south of Man O' War Boulevard. A second improvement section along Todds Road from 0.2 miles south of Andover Forest Drive to I-75 is scheduled for construction starting FY 2008. The third improvement section along Liberty Road from New Circle Road to Church of God is not scheduled for construction until FY 2019.

#### *Proposed Liberty Road Elementary School*

A new elementary school is proposed along Liberty Road and would be bordered by Star Shoot Parkway if it were extended. According to a spokesperson for the Fayette County Public Schools, the school is targeted to be completed by the Fall of 2007, and is expected to have a student population of approximately 650. Ingress and egress is anticipated from Liberty Road. However, it is expected that 40 to 50% of the students could potentially arrive via Star Shoot Parkway.

*Star Shoot Parkway*

According to the 2030 Transportation Plan, the Star Shoot Parkway extension is scheduled for construction in FY 2015. Quest Engineers estimated the potential cost to design and construct the Star Shoot Parkway extension in today's dollars. They evaluated four (4) alternatives ranging in cost from \$647,000 to \$1.412 million. The cost estimates vary depending on how the floodway and greenway are accommodated. The estimates are as follows:

Alternative	Alternative Includes	Cost
1	54" Pipe Culvert	\$647,000
2	24' x 11.5' Arch Culvert and 54" Pipe Culvert	\$875,000
3	60' span x 18' height Arch	\$1,020,000
4	Bridge for Greenway Path and Creek	\$1,412,000

Source: Quest Engineers, June 2005

**Analysis**

In order to test the attractiveness of the Star Shoot Parkway extension, the Lexington Area Metropolitan Planning Organization travel demand model was utilized. Working with the MPO, some minor network changes were made to the model. Using the 2004 Base Year, the Star Shoot Parkway extension was coded into the network and a model run was completed. This was then compared to the 2004 Base Year network with the extension.

Based on these results, approximately 5,000 vehicles per day would be diverted from other area roadways to the extension of Star Shoot Parkway. Traffic was diverted from Winchester Road, Sir Barton Way, and Man O' War Boulevard predominantly. In addition, Pink Pigeon Parkway would experience a small reduction in traffic. With the extension of Star Shoot Parkway, trips to and from the north would be able to use Liberty Road as an alternative to Winchester Road and Sir Barton Way. Trips generated along Liberty Road would no longer need to use Man O' War Boulevard to access Hamburg Place, resulting in less traffic at the Todds Road/Man O' War Boulevard intersection.

### *Liberty Road Construction*

The intersection of Todds Road and Man O' War Boulevard will most likely incur additional traffic delay during reconstruction of the intersection. Given that drivers will naturally wish to avoid construction areas, additional burden will be placed on Winchester Road and Sir Barton Way. Star Shoot Parkway would provide an alternative route to Man O' War Boulevard via Liberty Road during construction.

### *Proposed New Liberty Road School*

The probable location of the proposed student population for this school creates a need to accommodate student drop-off from both Star Shoot Parkway and Liberty Road. Parents from one side of the school district would otherwise be forced to drive significantly out of their way (either via Winchester Road or Man O' War Boulevard) in order to reach the school. Additionally, some form of roadway internal to the school's property with restricted access to public through traffic would be required to allow buses to get from Liberty Road to Star Shoot Parkway with minimal travel time, particularly given rising transportation costs.

Restricting access for through traffic would be necessary to prevent motorists from using this school infrastructure road as a "de-facto" Star Shoot Parkway extension. This internal road configuration and connections create additional infrastructure cost for the school, while putting additional traffic at presently congested intersections such as Todds Road/Man O' War Boulevard and Sir Barton Way/Winchester Road. The extension of Star Shoot Parkway would create a shorter path for parents and buses, and reduce the infrastructure cost of the school.

### **Conclusions**

As defined previously, levels of service at key intersections in the study area are presently at or near unacceptable levels and their operations will continue to degrade into the future. Analysis using the Lexington Area MPO model has shown that the extension of Star Shoot Parkway could generate 5,000 trips if it were opened today, and this could grow to 8,000 - 9,000 by 2010. While this would provide an important relief to capacity-constrained intersections, the current physical condition of Liberty Road (pavement, shoulders, drainage, etc.) must be considered before opening up the roadway to additional traffic. Timing of the construction of the

new elementary school and the widening of Liberty Road must also be carefully considered.

In summary:

- Currently, there is justification for the Star Shoot Parkway extension because of the growth in the study area and the resulting degradation of level of service along Man O' War Boulevard and Winchester Road. The Star Shoot Parkway extension would be one component of an overall strategy to mitigate increased traffic within the study area.
- The Star Shoot Parkway extension would not replace the need for the Cadentown Bypass, but instead accelerate the need for improvements along Liberty Road and Todds Road from New Circle Road to Man O' War Boulevard. In the interim, the physical condition of Liberty Road would need to be maintained at a higher level than the current investment until major widening can be completed.
- If the proposed Fayette County public elementary school is completed prior to the Cadentown Bypass project being completed, it is anticipated that school trips would further strain the Liberty Road/Todds Road intersection and create more difficulty in maintaining appropriate access to the school during construction.
- The Star Shoot Parkway extension should be completed before the proposed elementary school is opened. School design principles recommend separated bus and student drop-off areas. The extension would reduce the infrastructure investment by Fayette County Public Schools in restricted internal access roads needed, while still accommodating the necessary separation between buses and student drop-offs. In addition, drive times to the school would be reduced, which is particularly important given rising transportation costs.
- Access management guidelines generally recommend that access to a site be provided along the roadway serving the least amount of traffic and spaced outside the influence area of nearby intersections. The proposed elementary school access is currently planned along Liberty Road. Liberty Road is projected to handle greater than 50 percent more traffic than Star Shoot Parkway. Given this scenario, access to the school site via Star Shoot Parkway instead of Liberty Road should be considered. This is dependent on being able to provide adequate spacing between the school access point and the proposed intersection of Star Shoot Parkway and Liberty Road.

APPENDIX A

Hamburg Place – Winchester Road Retail -----	550,000 s.f.
Patchen Wilkes – Commercial Development -----	234,000 s.f.
Tuscany – Single Family Homes -----	1500 units
Tuscany – Apartments -----	1800 units
Tuscany – Community Recreation Building -----	80,000 s.f.
West Wind – Single Family Homes -----	90 units
Lifestyle Community Apartments -----	221 units
Lifestyle Community Condos -----	216 units
Heritage Baptist Church -----	34,000 s.f.
Sir Barton Office Ph. 1 – Lots G & H -----	140,000 s.f.
Drexel Furniture – Sir Barton Office – Lot F -----	40,320 s.f.
Bank & 2 Drive Thru Bays – Sir Barton Office -----	6,000 s.f.

Source: Quest Engineers (February 2005)